BULLETIN OF
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PROGRAM NUMBER

THIRTY SECOND ANNUAL MEETING

OF

THE GEORGIA ACADEMY OF SCIENCE

UNIVERSITY OF GEORGIA

ATHENS, GEORGIA

April 29, 30, 1955

Local Arrangements Chairman—Dr. Horace O. Lund
University of Georgia

Georgia Junior Academy of Science Meeting and Annual Science Fair, Savannah, Georgia, April 23, 24, 1955

BRING THIS PROGRAM WITH YOU TO THE MEETINGS

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Editor
W. B. Redmond

THE BULLETIN of the GEORGIA ACADEMY OF SCIENCE is published four times each year, in January, April, June and September and is sent without charge to all members of the Academy.

Articles to be published in the BULLETIN should be sent to the Secretary. Box 534, Emory University, Georgia. Reprints of articles will be furnished at cost.

PROGRAM

FRIDAY, APRIL 29, 1955

Morning

8:30-12:00	Registration; Reservations for Annual Dinner. Lobby, Baldwin Hall.
9:00-11:30	Section Meetings, Presentation of Papers.
11:30-12:00	Section Business Meetings.
12:00- 1:00	Luncheon. Snelling Hall, Denmark Hall or where you will.

Afternoon

1:15- 2:30	General Business Meeting of the Academy. Remarks by President. Auditorium. Little Memorial Library.
2:30- 5:00	Section Meetings, Presentation of Papers.
4:30- 6:00	Open House. See Section I—Biology.

Evening

6:30	Annual Dinner of Academy. Georgian Hotel, $2.00.
8:00	Annual Address: Manufactured Fibers, Past and Present. Dr. Linton G. Ray, Jr., Director of the Textile Research Laboratory, E. I. Dupont de Nemours & Company. Auditorium, Little Memorial Library.

SATURDAY, APRIL 30, 1955

Morning

9:00 12:00	Section Meetings, Presentation of Papers.

SECTION I

BIOLOGY

FRIDAY, APRIL 29, 1955, 9:00 A.M.

Auditorium, Main Library

THELMA HOWELL, Presiding

The Effect of Three Rates of Fertilizer on Yields and Other Agronomic Characters of Oats on Cecil Sandy Loam

H. D. MORRIS, A. R. BROWN, D. C. MOREY
University of Georgia Agricultural Experiment Station
Presented by A. R. BROWN

Nine oat varieties were planted on a Cecil sandy loam of low fertility and were subjected to three rates of fertilizer for a three year period.

Significant differences in yield occurred between varieties and also between fertilization rates. Some varieties reacted differently at the different fertilizer levels indicating the need of growing small grain tests on soils of varying fertility to get the true picture of the yielding ability of a variety.

Nitrogen content of the grain and straw weight of all varieties increased significantly as fertility level increased. Greatest increase in nitrogen of grain occurred when going from medium to high fertility level.

The average heading dates as well as maturity dates were earlier as the fertilization increased especially when going from low to medium fertility. There was no consistent effect of fertility level on test weight.

The low yielding variety produced the greatest income over fertilizer cost at the medium fertility level; income per acre decreased at the high fertility level. However, with the high yielding variety the income from the medium and high fertility levels was equal with no economic value being placed on the increased nitrogen content and straw weight at the highest fertility level.

10 Minutes. **2 x 2 slides.**

Methods Applied to Study the Effects of Intervals Between Milking on Milk Secretion

J. D. DONKER and H. L. DALTON, Dairy Department
University of Georgia
(Introduced by J. J. SHEURING)

Cows milked more often produce more milk. Cows milked at staggered intervals, such as 4 am and 3 pm daily, apparently produce as well as when milked at regular 12 hour intervals. On a staggered-hour schedule, yields of milk per hour are greater for the shorter interval. The milk yield at milking may not be a true reflection of the milk secreted since the last milking. There is an amount of milk remaining after complete milking which is dependent upon the total amount of milk present at milking time. Such milk is termed complementary milk and it is measured by removal under stimulus of a quantity of exogenous oxytocin (milk-ejection hormone). To more accurately measure the milk secreted, it is necessary to consider complementary milk. Intravenous injections of 10 i.u. of oxytocin were made at the completion of milkings to cows milked at intervals of 12, 11 and 13 or 10 and 14 hours and the complementary milk removed. Oxytocin was given after each of several milkings or spaced among regular milkings to minimize the

interaction with prior injections. The total milk secreted during an interval was arrived at by adding the complementary milk to the normal obtained at the end of the interval and eliminating the complementary milk present at the start of the interval. Both schemes support the contention that the hourly rate of secretion during the long intervals is equal to that in the short one though the apparent yield per hour was less.

10 Minutes.

A New Method of Cleaning and Sanitizing Dairy Equipment

JOHN J. SHEURING, Dairy Department
University of Georgia

One of the costliest and time consuming tasks in the dairy plant is the daily disassembling, sanitizing and reassembling of dairy equipment.

During the past five years, research at this and other stations has resulted in the acceptance by the United States Poblic Health Service of a method which can be used to clean and sanitize equipment effectively without the need of disassembly.

Research at the University of Georgia has shown that glass "Pyrex" pipelines, used for transferring either hot or cold milk, can be thoroughly cleaned and sterilized by recirculation of washing and sanitizing solutions at a rate of 3 feet per second for 5 minutes. Various types and concentrations of washing agents were used along with chlorine and hot water sanitizing solutions. Results indicated that the pipes could be made bacteriologically sterile.

10 Minutes. 2 x 2 slides.

The Pathological Effects of the Bacterium *Erysipelothrix rhusiopathiae* on Swine

DENNIS SIKES, Department of Pathology and Parasitology
University of Georgia

Erysipelothrix rhusiopathiae was used to infect swine three to five months of age. A rough colony isolated from the joints of chronic cases of arthritis and grown on tryptose agar produced no harmful effects. However, when smooth colonies isolated from swine dying of acute swine erysipelas, and grown in a semisolid medium enriched with 10 per cent horse serum were used, acute and chronic swine erysipelas was reproduced regularly.

When the smooth colony was used approximately one-third of the exposed swine died of acute swine erysipelas, one-third recovered and one-third developed chronic arthritis with many histopathological changes in the joints similar to some that occur in rheumatoid arthritis in man.

Blood cell changes in acute erysipelas consisted of leukopenia, lymphopenia, neutropenia, and a monocytosis, in acute polyarthritis, effusions, edema and inflammation of synovial membranes occurred. In advanced chronic polyarthritis, hypertrophy and hyperemia of the synovial villi, thickening of the joint capsule, panus formation, some erosions of the articular cartilages, and osteophyte formation with more or less ankylosis occurred, particularly in the carpal and tarsal joints. Osteophyte formation on the vertebral column also was of frequent occurrence. Histopathologically the joint changes were characterized by round cell infiltration with focal accumulations, and granulomatous formations.

10 Minutes. 2 x 2 slides.

Some Effects of Zinc Deficiency on the Anatomy of Cotton

WILLIAM M. CARLTON, Department of Botany
University of Georgia

Zinc has long been recognized as one of the essential micro- or trace elements in plant nutrition, and external symptoms of zinc deficiency are well known. The role of zinc in plant nutrition, however, is only beginning to be understood; and the effects of variations in the amount of available zinc on the histology and anatomy of plants has hardly been investigated at all.

Cotton plants grown in sand culture in the greenhouse were nourished for one month with complete nutrient solutions to which zinc had been added at the rates of 0.0, 0.05, 0.005, and 0,0005 p.p.m. respectively. At the end of the growth period the several vegetative organs of the plants were excised, killed and fixed, and made into slides for microscopic examination.

Root tips, mature roots, older and younger regions of the stems, and leaves were studied, as were the terminal buds. Some anatomical modifications apparently induced by the variation in zinc supply are discussed. Primary tissues develop essentially uniformly in all series, but plants deprived of zinc show retarded secondary growth. Meristematic activity decreases as the available zinc is reduced, and the precocious maturation of tissues in low-zinc plants is pronounced.

10 Minutes. 2 x 2 slides.

The Minor Element Content of Tree Leaves

MAX J. PLICE
Georgia State Department of Agriculture, Atlanta

This paper is a progress report on the study of the trace elements which trees remove from the soil in which they are growing. Since the leaves of a tree contain more of the elements than any other part of a tree, leaf samples were used for analysis. And, since the trace elements still occur in only very small amounts in the leaves, the latter were ashed carefully and determinations were made on the ash residues. For the study a Bausch and Lomb 1.5 meter Littrow spectograph was used. Only the ultra-violet region of the spectrum was studied—from about 2500 to about 3500 Angstrom units. All of the materials and methods used were standard in recognized spectography.

10 Minutes.

Effect of Acid Scarification on Seed of *Lupinus angustifolius*

ROBERT E. BURNS, U.S.D.A., Agricultural Research Service,
Field Crops Research Branch, and Georgia Experiment Station

Lupinus angustifolius seed are highly susceptible to injury by mechanical shock. This susceptibility prevents the use of mechanical means of scarifying the hard seed found in some strains. Seed can be scarified by soaking in concentrated sulfuric acid. The actual mechanism by which permeability is accomplished in this scarification has not been satisfactorily determined. By examination of scarified and unscarified lupine seed it was found that the acid completely removed the cuticle and in some seed eroded pits through the seed coat. Liquid entry into scarified seed occurred in part through the hilum cleft as well as through the eroded pits when they were present. Observation of the hilum cleft under changing moisture conditions indicated that the hilum of scarified seeds failed to close under high moisture conditions while in the

controls it did close. Stained sections of the hilum region of scarified and unscarified seed indicated that a partial hydrolysis of the counter palisades in the scarified seed was responsible for this difference.

10 Minutes. 2 x 2 slides.

Parasitic Adaptation in Helminthosporium Species

E. S. LUTTRELL, Georgia Experiment Station

Species of Helminthosporium on grasses show an unusual degree of variation in adaptation to the parasitic habit. *H. sorokinianum* occurs indiscriminately on a number of grasses. It quickly kills the invaded part of the host and grows chiefly as a saprophyte on the dead tissue. *H. Teres* and *H. dictyoides* are similar but are more highly specialized. Each is able to attack only a single host. One species, *H. gramineum*, is known to enter in a balanced relationship with its host. This fungus penetrates developing barley seed and, when the seed germinates, grows systematically within the barley plant. Pronounced symptoms appear only as the infected plant approaches maturity. A second species, *H. nodulosum* on goose grass (*Eleusine indica*), has now been demonstrated to be capable of establishing systemic infection. *H. nodulosum* may enter seedlings and spread throughout the host with little external evidence of its presence. It is not as well adapted as *H. granineum* since most of the infected plants die in the seedling stage. A few survive to maturity. The leaves then die back, the seed heads are "smutted," and the fungus fruits on the dead tissue.

10 Minutes. 3¼ x 4 slides.

Histochemical demonstration of sulfhydryl groups in plant tissues with 2,2′-Dihydroxy 6,6′-Dinaphthyl Disulfide

GENEVIEVE LUCCHESE, Department of Biology
Agnes Scott College

(Introduced by L. W. ROBERTS)

The developing embryos of germinating seeds of *Phaseolus vulgaris* L., *Ricinus communis* L., and *Zea Mays* L. were killed and fixed in trichloroacetic acid and histological sections were prepared by the paraffin method. The deparaffinized sections were incubated in an alcohol-barbital buffer containing the sulfhydryl reagent (2,2′-dihydroxyl 6,6′-dinaphthyl disulfide). The colorless disulfide product of the reaction between the sulfhydryl reagent and the SH group was converted to a highly colored azo dye at the histological sites of protein-bound sulfhydryl groups by coupling with tetrazotized diorthoanisidine (modification of the Barrnett and Seligman method). The reaction was completely inhibted by pretreatment of the tissues with a 1% aqueous solution of N-ethyl maleimide. Preliminary results have indicated high centers of protein-bound sulfhydryl groups in the epicotyl and radicle of embryos in the initial stages of germination. The provascular strands of the epicotyl and inner cortex and outer stele of the radicle show high localization of these groups. Sections from mature radicles of *P. vulgaris* L. and *R. communis* L. exhibit staining in a tetrapolar pattern indicative of secondary root formation.

10 Minutes. 2 x 2 slides.

A Comparison of the Staining Methods for Sulfhydryl Groups in Plant Tissues

LORIN W. ROBERTS, Department of Biology
Agnes Scott College

Histological sections of embryos were prepared from germinating seeds of several higher plants. The sections were stained by modifications of the following techniques for the histochemical localization of sulfhydryl groups: Barnett and Seligman method 2,2′-dihydroxy 6,6′-dinaphthyl disulfide), Bennett method (1-(4-chloromercuriphenylazo)-naphthol-2), and the Flemming method (nitroprusside reagent). The tissue sections were placed in the following categories according to pretreatment: cyanide treated (cystine to cysteine conversion), trichloroacetic acid tested (protein-linked disulfide to sulfhydryl conversion), and untreated (unbound glutathione). Untreated sections, in all experiments, gave weak staining reactions for glutathione. Preliminary experiments have indicated no significant difference between reactions given by cyanide and TCA treated sections. Complete inhibition of staining was observed, in all experiments, when tissues were initially treated with a 1% aqueous solution of N-ethyl maleimide. The Barnett and Seligman reagent gave the best and most consistent results of the methods tested. Monocoupling of SH groups to the reagent gave a red color (low concentrations of SH), a mixture of monocoupling and dicoupling gave a reddish-blue color (medium concentrations of SH), and dicoupling gave a purple color (high concentrations of SH).

10 Minutes. 2 x 2 slides.

11:30 Business Meeting of Section, Auditorium, Main Library
WILBUR H. DUNCAN, Presiding

BIOLOGY SECTION

FRIDAY, APRIL 29, 1955, 2:30 P.M.

BIOLOGICAL RESEARCH OPPORTUNITIES (Panel Discussion)
Auditorium, Main Library

THELMA HOWELL, Wesleyan College, Moderator

1. Research Opportunities Requiring Only Small Budgets.
   1. Agriculture - animals ..... Robert Wheeler
      College of Agriculture, University of Georgia
   2. Agriculture - plants ..... Julian Miller
      College of Agriculture, University of Georgia
   3. Bacteriology ..... John Foster
      School of Veterinary Medicine, University of Georgia
   4. Cytology, morphology, taxonomy ..... J. J. Westfall
      Department of Botany, University of Georgia
   5. Ecology ..... E. P. Odum
      Department of Zoology, University of Georgia
   6. Entomology ..... J. J. Paul
      Department of Entomology, University of Georgia
   7. Herpetology ..... Bernard Martof
      Department of Zoology, University of Georgia
   8. Histology ..... Elizabeth Sawyer
      Piedmont College
   9. Human Nutrition ..... Leonora Mirone
      School of Home Economics, University of Georgia

II. Difficulties of Subsidy Procurement in the Small College
Clyde Keeler, Georgia State College for Women

III. Sources and Methods of Obtaining Research Funds
George King, Associate Director, Georgia Experiment Station
George H. Boyd, Dean, Graduate School, University of Georgia

DEMONSTRATION PAPERS

Room 311, Baldwin Hall, 4:30-5:30 P.M.

Fat Deposition in Migratory and Non-Migratory Birds

CLYDE E. CONNELL, Department of Zoology
University of Georgia

This study is concerned with the determination of lipid levels in migratory and non-migratory birds at various seasons of the year. Data obtained include total fat content, wet and dry weights, relative amounts of water in the tissues, etc. The technique centers around extraction with various solvents by means of the Soxhlet reflux extractor. Comparisons are made between migratory and permanent resident species. Migratory birds always show two, and usually three heavy depositions of fat each year; there is a deposition just prior to the two migratory flights, with another deposition occurring in mid-winter. Permanent resident birds, on the other hand, show only a moderate amount of fat deposition once yearly—in winter.

The proposed demonstration will include a display of the equipment used, and samples of the extracts and residues with appropriate labels.

The Buprestidae of Georgia

RUDOLPH T. FRANKLIN, Department of Entomology
University of Georgia

Beetles of the family Buprestidae are of importance because of the variety of damage they cause. Healthy trees are attacked and often killed by species which work in the cambium or mine their leaves. Timber is degraded or ruined by the tunnelling of wood boring species and by gum spots left when the mines of these borers have healed over. The larvae are called flatheaded borers from the fact, that in most cases, they have a greatly enlarged and flattened first thoracic segment, which appears to be a large flat head. Actually the head is deeply embedded in the prothorax and is scarcely visible.

Because of their unusual and, and in many cases, brilliant coloring, the beetles are a favorite group of many hobbyist-collectors. The 93 species recorded from Georgia represent a wide variety of habitats from leaf mines to dead stumps, and not a few unusual habits including attraction to fires and mountain tops.

An illustrated key to our 93 species is presented which makes accurate determinations possible by persons with only a limited experience in entomology. Thus it should be a helpful tool to the high school project leader, hobbyist, forester and agricultural worker, as well as the professional hobbyist.

Demonstration of the Expression of Gene Interaction in the Coat Color of the House Mouse

CAROLYN WELLS, Agnes Scott College

Mice were received last spring from Oak Ridge where they had undergone irradiation in the embryonic stage. Mutations developed as a result of the radiation affecting coat color. Observations have been made on

the inheritance of the induced mutations. Work has also been done in determining exact genotypes of parent generations by observation of F_1 and F_2 phenotypic characteristics.

A Seed Treatment Test—Demonstrating the Use of New Fungicides

J. H. MILLER and G. E. THOMPSON, Department of Plant Pathology
University of Georgia

Cotton and corn seed are used in this demonstration. The organisms usually found on cotton seed the *Glomerella gossypii, Fusarium monififorme* along with *Rhizopus nigricans* and *Xanthomonas malvacearum.* On corn seed there are *Aspergillus flavus, Fusarium monififorme, Rhizopus nigricans,* and *others.*

The treatments used are for the purpose of destroying surface organisms and so increasing stand. Ceresan, Arasan and Spergon are placed in the test for comparison with the newer forms such as Agrox, Mema, PCNB and Panogen. Treated seed are in sterile Petri dishes on potato dextrose agar. The effectiveness of the chemicals is judged by the degree of organism repression.

The Separation and Identification of the Acid Soluble Phosphates in Plants

EDWIN BECK, Department of Botany
University of Georgia

The phosphates are extracted from the ground plant tissue with cold trichloroacetic acid solution from which they are fractionally precipitated as barium salts. The phosphates that are obtained as the barium salts are then converted to the acid form with Dowex 50 or to the sodium salt with sodium sulfate solution. The compounds of each fraction are separated and identified by paper chromotographic methods.

Wild Flowers of North Georgia

ESTELLE DAVID, North Georgia College

This collection of wild flowers was begun four years ago, not from a scientific point of view, but merely as a hobby because I enjoy hiking in the mountains and I was impressed by the great variety of blooming plants found in the North Georgia mountains.

The specimens of this exhibit were collected in the counties of Lumpkin, Hall, White, Dawson, Towns, and Union, with most of them coming from Lumpkin. Some of the most productive areas were Amicolola Falls, the hillsides around Cane Creek Falls, the trails leading from Woody's Gap, the vicinity of Wolf Pen Gap, around Lake Winfield Scott, at Vogel State Park, Helton Falls, all along the Appalachian Trail from Woody's Gap over Cedar, Slaughter, and Blood Mountain to Neel's Gap, around the lakes at Hiawassee, and the picnic area near the top of Brasstown Bald Mountain.

The collection at present includes 192 specimens and represents 46 flower families. It has been shown to a number of classes and science clubs in elementary schools. Loose-leaf notebooks have been used because this method makes it easier to carry to the schools. The collection has also been exhibited to the Dahlonega and the East Point Garden Clubs and used for demonstration purposes in a nature study course offered primarily for elementary-school teachers at North Georgia College during the summer terms.

Reference books used in naming the flowers and equipment used in the project will also be exhibited.

New Pteridophyta Records for Habersham and Banks Counties, Georgia

ELIZABETH L. SAWYER, Department of Biology
Piedmont College

Three ferns, previously unreported from Habersham County, have been found there. The small chain fern, *Lorinseria areolata* (L.) Presl. occurs along small creeeks in Clarkesville and Cornelia. The royal fern, *Osmunda regalis* L., occurs in swampy soil near creeks in Demorest and Clarkesville. Single specimens of the coarse-lobed grapefern, *Botrychium dissectum* Spreng., var. *tenuifolium* (Underw.) Farwell, were found in two areas, one near Cornelia and one in Demorest, both a short distance from small creeks.

The small chain fern also occurs in Banks County in a swamp. Running ground pine, *Lycopodium complanatum* L., occurs in a pine grove along a country road in Banks County.

These Pteridophytes have been identified elsewhere in Georgia but not from the two counties as reported by this author.

Use of the Electron Microscope in Research

PAUL BURKHOLDER, Bacteriology Department
University of Georgia

A Kodachrome Slide Multiple Subject Index Established on One Set of Cards

WILBUR H. DUNCAN, Department of Botany
University of Georgia

Standard Key Sort cards are printed with a large number of desired items. After being marked, these cards facilitate location of all slides covering the following categories:—any plant species, genus, or family; physiographic provinces or ecological habitats; and the special subjects—erosion, geology, weeds, agriculture, aquatics, poisonous plants, ornamentals, floral characters, fruit characters, vegetative characters, diseases, vernalization, fall color and scenes. Other categories may be added. A sorting needle inserted thru the appropriate holes will allow the removal of all cards that do not pertain to the subject in question. This index makes it possible to locate quickly slides for class, popular lecture, or other use. Unexpected needs for kodachromes during class sessions can be met with very little interruption of class activities.

Garden Information and Materials

FRED C. GALLE, Ida Cason Gardens
Chipley, Georgia

4:30-6:00 Open House.

College of Agriculture

Agronomy	Conner Hall
Animal Husbandry	Hardman Hall
Dairy	Dairy Building
Food Technology	Food Processing
Horticulture	Greenhouses, Conner Hall
Plant Pathology and Plant Breeding	Plant Pathology
Poultry	Poultry Building

College of Arts and Sciences
- Bacteriology ..... Baldwin Hall
- Botany ..... Baldwin Hall
- Entomology ..... Baldwin Hall
- Zoology ..... Baldwin Hall

School of Home Economics
- All Departments ..... Dawson Hall

School of Pharmacy
- All Departments ..... Pharmacy Building

School of Veterinary Medicine
- All Departments ..... Veterinary Building

BIOLOGY SECTION

SATURDAY, APRIL 30, 9:00 A.M.

Auditorium, Main Library

WILBUR DUNCAN, Presiding

The Relationship Between Growth, Age, and Spacing in Slash Pine (*Pinus elliottii*) Plantations for Various Site Indices

E. A. KREIS, JR. and A. E. PATTERSON, School of Forestry
University of Georgia

Dominant height, in slash pine plantations, regardless of the spacing, increases on the average of about three feet a year up to approximately 25 years of age.

Until competition shows effect, diameter growth increases at the rate of about 0.84 inches per year. According to data collected, the points at which competition starts showing its greatest effect for the 8 X 8 foot, 10 X 10 foot, and 15 X 15 foot spacings is respectively 8, 10, and 13 years of age. After competition sets in, diameter growth increases at the rate of 0.23 inches in 8 X 8 foot spacings, 0.25 inches in 10 X 10 foot spacings, and 0.16 inches in 15 X 15 spacings.

Rate of volume growth and total volume increases as spacing decreases due to the higher number of stems per acre in the closer spacings. Volume increases annually at the rate of 3.9 cords in 8 X 8 foot spacings, 3.3 in 10 X 10 foot spacings, and 2.0 in 15 X 15 foot spacings.

Depth to soil mottling affects volume in the following manner. For every increase of 10 inches in depth to mottling, up to 60 inches, in an 8 X 8 foot and 10 X 10 foot spacing, volume increases 1.7 and 1.6 cords respectively. In a 15 X 15 foot spacing volume decreases 0.5 cords for every increase of 10 inches depth to mottling, up to 60 inches.

10 Minutes. 2 x 2 slides.

An Ecological approach to the food habits of the Barn Owl in Two Physiographic Provinces in Georgia

JAMES H. JENKINS, School of Forestry
University of Georgia

(Introduced by A. E. PATTERSON)

Food habits within certain preference limitations reflect availability of prey items. Over 1300 items have been tabulated from an upland area in the Piedmont and a coastal marsh in the Lower Coastal Plain.

Rats, mice, and shrews constituted 96.9% of 928 items from the Piedmont with cotton rats, house mice, harvest mice and old field shrews predominating. Birds made up 2.3% and consisted mainly of sparrows. Rats, mice and shrews made up 72.4% of 410 prey items from the Coastal Plain with rice rats and old field shrews predominating. Birds made up 24.9% of the food with Red-winged Blackbirds being most represented. These pellets yielded data which contributed to our knowledge of the distribution and status of the jumping mouse, meadow mouse, and the round-tailed water rat in Georgia.

10 Minutes. 3¼ x 4 slides.

Tissue Culture of Insect Gall Tissue

EDWIN BECK, Department of Botany
University of Georgia

The larva of *Eurosta solidaginis* Fitch induces the formation of a massive parenchymatous stem gall on *Solidago plants*. Since this gall contains large amounts of meristematic tissue it was chosen as a source of tissue for this work. Galls were broken open, the tissue removed with a sterile scalpel and placed on White's medium in 125 ml. flasks. This medium contained all of the essential elements necessary for plant growth in addition to 2% agar, vitamins, and sucrose. Tissues remained alive for several months on this medium but showed no signs of proliferation. Similar results were obtained with media in which the proportions of nitrate, phosphate, potassium, and vitamins were increased to either 10 or 100 times those used in the standard White's medium. The presence of gall begetting insect larvae in the cultured tissues failed to induce growth in these tissues. Roots developed within a week on tissues placed on White's medium which contained 10 to 1000 parts per million of beta indole acetic acid or similar amounts of 2-4 dichlorophenoxy acetic acid.

10 Minutes. 3¼ x 4 slides.

Techniques Utilized in the Evaluation of Temporary Summer Pastures

W. J. MILLER, Dairy Department
University of Georgia

Several valuable techniques for evaluating various pasture crops, management systems, etc., have been developed. Some of these were used to compare Tift Sudan and Starr Millet. Lactating cows respond differently than other cattle to a given pasture. Consequently, balanced groups of lactating cows were employed. Since it is impossible to completely balance groups, a double reversal design in which each cow serves as her own control was chosen. This design also removes the normal decline in lactation level. Because of variations in fat tests among cows, the milk was calculated to an equivalent energy basis known as 4% of fat corrected milk. Another measure that was used was persistency of milk production. Not all of the nutrients consumed are used for milk production. Therefore, the total amount of nutrients utilized for milk production, weight gains and body maintenance were determined by the use of feeding standards in reverse. This total is expressed as Total Digestible Nutrients (TDN). These total yields were also determined by clipping areas in the pasture and similar ungrazed areas under cages at the end of each grazing period. The differential growth rate under the cage and in the pasture is adjusted by the use of

additional clippings and a formula. Results by this method and the animal requirement method agreed quite closely. Digestibility and the amount consumed were estimated by the use of two non-digestible indicators. One occurs naturally in the feed and the other is administered orally.

Others who have made contributions to these studies include L. M. Underwood, H. L. Dalton, J. H. Rogers and J. D. Donker.

10 Minutes.

Magnesium Needs for Plant Growth in Georgia

S. TUN THAN and MATTHIAS STELLY, Agronomy Department
University of Georgia

A field and laboratory study of magnesium needs of sweet corn was conducted in 1954. The rates per acre of magnesium used on a light, sandy south Georgia soil were (1) no magnesium (control), (2) 30 lbs., (3) 60 lbs., (4) 120 lbs., (5) 120 lbs. plus a 75 lbs. mixture of minor elements, and (6) 120 lbs. plus a 75 lbs. mixture of minor elements. Magnesium used in the first five treatments was magnesium sulphate, whereas in the last treatment it was dolomitic limestone.

A latin square design of the six treatments, each in a 14′ x 50′ plot, was used in the middle of a very large field of sweet corn. The whole field was managed uniformly by the farmer, including irrigation and N. P, K fertilization.

The objectives were to investigate whether the soil was deficient in magnesium or a minor element, and to determine the influence of magnesium sulphate and dolomitic limestone on yield and content of magnesium in sweet corn if the soil was deficient in magnesium.

Plant leaf and grain samples were analysed for magnesium and yield records were obtained. On the basis of this preliminary study it appears that some of the sandy coastal plain soils of south Georgia are low in magnesium. Results indicate that sweet corn will respond by yield and in percentage of magnesium increases to additions of 1000 lbs. of pulverized dolomitic limestone or up to 1200 lbs. of magnesium sulphate (120 lbs. of magnesium) per acre to these soils.

10 Minutes.

Destruction of Cuban Woods by Marine Boring Organisms

WILLIAM E. WARD, Department of Biology
West Georgia College

(Introduced by WILBUR H. DUNCAN)

Destruction by marine boring organisms of wooden pilings immersed in salt water is an important problem. In World War II, Navy docks in various waters of the world were attacked by marine borers. Treatment of wood with preservatives enjoys popular success but is costly and protection may not be permanent.

This project is a study of resistance of eight species of untreated Cuban woods to marine boring organisms. The study was made at Duke Marine Laboratory, Beaufort, North Carolina over an eight month period, October 1950 through June 1951. The mean salinity was 30 parts per mille, and the mean tidal range 2.5 feet. The water contained much sediment and occasionally an oil slick was present.

Species of wood were obtained from Compania Azucarera del Golfo, Matanzas Province, Cuba, and are *Dipholis salicifolia*, *Mimusops albescens*,

Calophyllum lucidum, Tabebuia pentaphylla, Metopium toxiferum, Andira inermis, Lysiloma bahamensis, Eucalyptus rostrata. All woods were cut into panels 12″ x 6″ x 1″ and four panels of each species immersed at all times in a vertical position approximately twelve inches below mean low water under the Marine Laboratory Pier. Panels of each species of wood were removed at two month intervals, preserved in formalin and studied with a stereomicroscope. The primary marine borer was found to be a mollusk, the shipworm, *Bankia gouldi* Bartsch. Three Cuban woods were found to be resistant after eight months immersion. Heaviest attack was during the warm months.

10 Minutes. 3¼ x 4 slides.

Seedling Characteristics of Conifers of Southeastern United States

DAVID J. de LAUBENFELS, Department of Geography and Geology
University of Georgia

(Introduced by WILBUR H. DUNCAN)

Different conifer genera can usually be distinguished by their seedlings alone, but, because conifer seedlings often differ radically in leaf characteristics from the adult plants, their identification requires special knowledge of conifer seedling characteristics. Conifers are important both numerically and commercially in Southeastern United States, so a knowledge of their seedling characteristics should be of value to anyone who has to deal with them. There are ten genera in a total of four families of conifers native to the southeast and, in addition, there are five genera, belonging in three of the four families, which are commonly cultivated. A description of the distinctive characteristics of the seedlings for each of these genera is given.

10 Minutes.

The Present Extent and Distribution of Hardwood Forest Types in the Piedmont

THOMAS C. NELSON, Athens-Macon Research Center
Southeastern Forest Experiment Station

(Introduced by W. A. CAMPBELL)

The Southeastern Forest Experiment Station in cooperation with state agencies and industry has gathered reliable forest type data in the southeastern Piedmont. This paper describes the present distribution of hardwood forest types in the most recent survey as well as comparisons with previous surveys to establish trends.

Some of the facts discussed in this proposed paper include:

1. Hardwood forest types now occupy 49 percent of the forest land in the Piedmont.
2. The distribution of forest types is not uniform throughout the Piedmont.
3. In terms of timber volume, net sound hardwood volumes exceed pine.
4. Approximately one-quarter million acres per year are passing from a pine type to a hardwood type.

10 Minutes. 2 x 2 slides.

Use of *Aspergillus niger* for Determining Potash in Georgia Soils

R. H. TROUPE, JOEL GIDDENS, and H. F. PERKINS, Agronomy Department, College Experiment Station, Athens

A study was made to compare a biological assay method of determining K_2O in soils with chemical methods of analysis and with crop yields.

Sixty samples of Georgia soils of known type and history were selected for study. To 2.5 grams of soil was added 30 ml. of Mehlichs' medium containing sucrose and inorganic elements minus K. A suspension of *Aspergillus niger* spores was then added and the culture allowed to incubate at room temperature for 10 days. The pads or masses of mold mycelium were removed, dried and weighed. Available K_2O was determined by a rapid method using dilute HCl-H_2SO_4 as the extractant and K_2O values were read directly by use of a flame photometer. Exchangeable K_2O was determined by the method of Schollenberger and these values were read on a flame photometer using the internal standard.

A significant correlation was obtained between the weight of *A. niger* pads and K_2O as determined by the two chemical methods. Good correlation was also noted between the two chemical methods of determining K_2O. Yield data were obtained for two soils and a positive relationship was found to exist between yields of cotton and corn and potash determined by either of the methods.

10 Minutes.

Apparatus for Evaluating Analeptic or Sedative Compounds in Mice

SELDON D. FEURT and JOSEPH P. LAROCCA, School of Pharmacy University of Georgia

An apparatus has been devised for recording activity in small animals. Normal values with standard deviations for adult female Albino mice have been established for one, two, three, and four hour periods so that analeptic or sedative type compounds can be compared to control animals.

10 Minutes.

Visualizing Probability in Hybrid Crosses

PAUL L. GUPTILL, Science Department, North Fulton High School Atlanta

The art form known as the mobile may be used to illustrate probability in monohybrid and dihybrid crosses. The technique lends itself to many examples and is limited only by the imagination of the user. Pieces of cardboard, heavy paper, metal or plastic are cut to represent pairs of contrasting characters and suspended by threads. As the pieces rotate, phenotypic ratios may be determined.

10 Minutes.

Medicinal Plant Production in Yugoslavia

ARNOLD KROCHMAL, Department of Botany
Morris Brown College

Yugoslavia is one of the world's leading producers of drug plants, including large amounts of opium. The government has a vigorous program of research aimed at increasing production and yields. Chemists, botanists and others work as a team.

Most of the crop is harvested by hand in rural areas.

10 Minutes. 2 x 2 slides.

Biological Materials in Primitive Cuna Music

CLYDE KEELER, Georgia State College for Women

Primitive man's musical instruments, like most of his cultural objects, consist of adapting biological materials to his purposes without much reworking of those materials.

This is quite true of his musical instruments, for example. Cuna Indian musical instruments consist mainly of gourd rattles (nasis), wing bone and reed flutes (kammu) and skull whistles (nono). There is no tom tom for loudly beating time for dances, but its place is taken by vibrating the lower lip of a turtle shell (tinku ukka) which causes the resonance chamber to "bark."

By selecting seven small reeds of different diameters and different lengths an instrument is produced (kammu purwi) known as Pan's pipes. By making two sets of reeds, one tuned a step higher than the other, and allowing each set to be blown by a separate individual, considerable advance in versatility is produced. This is actually the beginning of the pipe organ.

A collection of primitive Cuna instruments will be exhibited, and recorded music on them by native musicians will be played.

Section II

CHEMISTRY SECTION

FRIDAY, APRIL 29, 1955, 9:00 A. M.

Room 307, Baldwin Hall

Chairman, J. EDGAR MORRIS, Presiding

2,4-Dinitrobenzenesulfenyl Chloride in Qualitative Organic Analysis

CHARLES M. BUESS, Department of Chemistry
University of Georgia

2,4-Dinitrobenzenesulfenyl chloride [$C_6H_3(NO_2)_2SCl$] is a reasonably stable substance. The sulfur atom, impinged between two electronegative groups, is susceptible to neucleophilic attack by a variety of agents. The products are, for the most part, solids which are easily recrystallized and are useful in qualitative organic analysis. The reagent has been studied in connection with the characterization of olefins, aromatic systems, alcohols, amines, mercaptans and ketones.

15 Minutes. 3¼ x 4 slides.

An Improved Phenylhydrazine Reagent

W. KNOWLTON HALL, LUCIA O. MOODY, and V. P. SYDENSTRICKER,
Departments of Biochemistry and Medicine, Medical College of Georgia

A disadvantage in the use of the phenylhydrazine reagent for the identification of sugars is the instability of the reagent. The reagent as commonly used must be freshly prepared. Even with the fresh reagent, on heating, and on standing after heating, considerable tar formation may occur. The improved reagent consists of 20 grams of phenylhydrazine hydrochloride and 20 grams of sodium acetate dissolved in 200 ml. of 3% sodium bisulfite at room temperature with stirring, In use this reagent is added to an equal volume of 0.2 molar sugar solution and the test is then carried out in the usual manner. After two months crystals of a compound formed by the combination of the phenylhydrazine and sodium bisulfite begin to form in the reagent. The reagent is usable for at least six months and usually for a year from the time of preparation. For this length of time the bisulfite present serves effectively to prevent tar formation.

10 Minutes.

Filtering Practices in Product Pipe Line Operation

IVY M. PARKER, Field Technologist
Plantation Pipe Line Company

Product pine line operators have a serious responsibility in maintaining the quality of the many high grade products which they transport. The refining industry is spending millions of dollars to upgrade their products for more efficient fuels. The pipe line is the connecting link between the refiner and the consumer. Precision in operation and metering is the essence of pipe line operation. Filtration is a necessary step in this operation. It involves removal of materials which might damage pump, pump seals, and meters, as well as materials which will clog burners and carburetors. It is the responsibility of the refiner to deliver clean products to the pipe line.

Since all products handled by products pipe lines are distillate fuels, they should be clean. However, petroleum products carry some dissolved or associated water and corrosion can build up rust scale. These deposits are kept to a minimum by good corrosion inhibition practices.

A survey of the industry is presented which shows that every products pipe line company is filtration conscious. Their practices vary widely because of different physical setups. Excelsior, fine mesh screens, and sock type strainers are used.

The suppliers are aware of the problem and are making their contributions to the design of equipment and filter media. Two recent developments are described.

20 Minutes. 3¼ x 4 slides.

Monochloramine

ERVIN COLTON, School of Chemistry
Georgia Institute of Technology

Monochloramine is presently one of the most widely used chemicals not only in water purification but also in the synthesis of hydrazine. For these reasons, the chemistry of this highly reactive molecule bears attention.

Monochloramine may be prepared by any of the following procedures: (1) The reaction between ammonia and inorganic hypochlorites; (2) The reaction between ammonia and *t*-butyl hypochlorite; (3) The hydrolysis of dichlorourea; (4) The reaction between chlorine and ammonia, and (5) The acid hydrolysis of potassium chloraminosulfonate.

The properties, methods of analysis, and some reactions of monochloramine will be discussed.

15 Minutes. 3¼ x 4 slides.

Anhydrous Hydrogen Fluoride as a Solvent

WILLIAM H. WAGGONER, Department of Chemistry
University of Georgia

Interest in non-aqueous solvent systems has been steadily and rapidly growing in recent times. The use of liquefied anhydrous hydrogen fluoride as a solvent has received particular attention with the increasing commercial availability of metallic fluorides and the rapid development of the fluorocarbon industry.

This paper reviews the more important historical developments which have led to the present "heavy chemical" position which HF now occupies. The physical and chemical properties of hydrogen fluoride are summarized with particular emphasis being placed upon those properties which affect the solvent power of this material. The laboratory handling of anhydrous hydrogen fluoride is also discussed.

A mimeographed summary of the solubilities in this medium and a partial bibliography will be distributed.

20 Minutes.

A Rapid Ion Exchange Separation with Simple Equipment

WILLIAM H. JONES, Department of Chemistry
Emory University

A resin column and accessories have been constructed for the effective and routine separation of certain rare earth ions. Rapid performance is obtained by using fine-mesh resin under conditions of elevated temperature and pressure. The mixture to be resolved contains about 20 mg. each of yttrium, cerium, neodymium, and samariumions. The accessories are principally an automatic collector for delivering the output into successive vessels, and an interval controller for timing the operation. Columns, collector, controller, and other accessories, all built in the labortory at surprisingly small cost, have functioned very dependably. Construction and operation of the equipment will be detailed, and performance data given.

15 Minutes. 3¼ x 4 slides.

Trace Elements in Plant Growth

A. A. NIKITIN and JULIA P. GOODE, Tennessee Corporation Research Laboratories, College Park

The trace elements, iron, manganese, copper and zinc have proved to be of great value in agriculture. The uptake of ions from the soil by roots is based upon the ion exchange process. Carbon dioxide liberated as a result of transpiration is responsible for the accumulation on the root surface of H+ ions necessary for the exchange of cations be-

tween soil and root. The translocation of ions from roots to foliage involves diffusion, absorption and chemical combination. Metabolic processes in the plant are responsible for the release of energy required in the absorption and translocation of ions from roots to stem and foliage.

The assimilation of oxygen in plant respiration is catalyzed by iron, manganese and copper which function as components of enzyme systems, such as cytochrome. The catalytic roles of iron, manganese and copper are specific in the oxidation-reduction processes involved in plant growth. There are no substitutes for these elements in plant nutrition and photosynthetic processes. It is particularly important that both iron and manganese be present in the divalent form.

Most soils are deficient in trace elements due to the following factors:

1. Loss through leaching.
2. Tying-up by soil components, such as clay and organic matter
3. Failure to replenish trace elements removed by crops.

The character of the soil (pH) and interference between nutrient elements affect the rate of trace element availability. The type of trace element salt and the method of application also influence availability of the elements.

Deficiency symptoms which appear on the foliage can not be taken as the only criterion of a lack of available trace elements in the soil, since the symptoms may not develop until late in the season. A new condept, the measurement of enzyme activity (e.g. ascorbic acid oxilase), is being worked out as a method for determining trace element deficiencies. This may develop into a new technique of solving the problems of trace element deficiencies.

20 Minutes. 2 x 2 slides.

Determination of Indium in the Investigation of the Gallium-Indium-Mercury System By Flame Photometry

DONALD SCHLUETER and PERRY FOSTER, Chemistry Department
Georgia Institute of Technology

A rapid and accurate method for the determination of very low concentrations of indium in the presence of mercury and gallium was found necessary during an investigation of this three component system. The classical methods of analysis involve, 1) the preliminary separation of gallium and indium from mercury with hydrochloric acid, and, 2) the separation of gallium from indium by taking advantage of the difference in their amphoteric properties. Since this present study involved samples containing indium in a concentration range of 0 to 600 ppm these methods proved unsatifactory. Flame photometry appeared to be the most suitable method available.

Indium was chosen for flame analysis instead of gallium because the sample must be kept in a slightly acid medium of gallium chloride solution to prevent surface oxidation and hydrolysis of the gallium.

The indium emission was measured at a wavelength of 451.1 mu using a Beckman DU flame photometer equipped with a photomultiplier attachment and hydrogen burner.

A study of interferences due to the presence of hydrochloric acid and gallium was carried out. This study indicated that hydrochloric acid did not interfere when present in the concentrations used in dissolving the sample. Gallium was found to interfere with the indium emission due possibly to a partial reduction of indium by gallium. However, this difficulty can be overcome by following certain precautions which insure accurate and reproducable results in the flame photometric determination of indium.

3¼ x 4 slides.

Variations in the Chemical Character of Small Streams

ROBERT S. INGOLS and GEORGE M. JACOBS, Engineering Experiment Station, Georgia Institute of Technology

Basic studies of the character of small streams have been undertaken with the help of the United States Geological Survey. We have determined dissolved oxygen, pH and biochemical oxygen demand, while the men from the Survey have measured the flow at the time of the chemical sampling. Later as samples were taken for 14 hours continuously, we made all of the observations.

The data show that streams in the same drainage basin have a marked similarity in chemical characteristics on any one day. However, the time of year, the weather and the quantity of flow have a marked bearing upon the quantity of dissolved organic material and dissolved oxygen.

A three fold increase in flow between the low and high value may occur within 13 hours during a clear day. Changes in the chemical quality of water also occur but the cause of the variations is not obvious.

20 Minutes. 3¼ x 4 slides.

CHEMISTRY SECTION

2:30 P.M.

Symposium

What's a Silicone? (A 16mm sound technicolor movie). Discussion

RALPH B. EHLERS, Manager Atlanta Branch Office
Dow-Corning Corporation

SECTION III

EARTH SCIENCE SECTION

FRIDAY, APRIL 29, 1955, 9:00 A.M.

Room 109, LeConte Hall

Chairman, NELSON SEVERINGHAUS

NELSON SEVERINGHAUS and ELDON J. PARIZEK, Presiding

A Critical Anlysis of Soil Creep in the Piedmont

JAMES F. WOODRUFF and ELDON J. PARIZEK
University of Georgia

This paper reviews criteria of soil creep advanced by Sharpe in his classic study *Landslides and Related Phenomena*, and critically examines mechanics supposedly producing the principal evidence of soil creep in the Piedmont. It concludes that most features indicative of soil creep are either absent or better explained by other gravitative methods, and that the principal substantiating feature is mechanically improbable as a product of soil creep. It is believed, therefore, that soil creep, as defined by Sharpe, has received an unwarranted acceptance and should be re-appraised as a geomorphic process in the Georgia Piedmont.

12 Minutes. 2 x 2 slides.

Mississippian Reef Structures in Northwest Georgia

VAUX OWEN, Geology Department
Emory University

Coral reef structures occur in the Mississippian limestones on Lookout and Pidgeon Mountains in Northwest Georgia. The reef horizons are conspicuous in outcrop due to resistance to erosion imparted by the densely-packed corals which have been largely replaced by silica.

Original reef conditions are preserved in the specimens observed. Microscopic examination indicates a growth by slow accumulation of organic material and scarcity of bioclastic material. Corals of the Lithostrotion type are conspicuous and in places densely-packed but the mass of interstitial material is composed of foraminiferal tests, algae, and other small organic forms. Oolitic texture is developed to a considerable degree. Porosity is low, cryptocrystalline calcareous material filling all available interstices. Authigenic, crystalline calcite and dolomite are present but not dominant.

It is believed that the reef sections represent the Mississippian biohermal environment, growth having occurred largely by accumulation of micro-organisms under stable tectonic conditions and calm seas.

10 Minutes. 2 x 2 slides.

Comparison of Stream Sediments from a Metamorphic Area with Those from an Igneous Source

KENNETH G. WALTER, Geology Department
Emory University

Streams in the vicinity of Stone Mountain, in DeKalb County, Georgia, carry sediments from areas of igneous or metamorphic rocks, or both. Samples from sand bars in these streams have been collected and studied to determine the significant differences in the types of sediments originating in each area.

The investigation is chiefly a mineralogical one with data included on per cent of occurrence of dominant minerals and analyses of particles with respect to size, shape, and roundness. The mineral content of the sediments is then compared with that of the rocks over which the streams flow.

10 Minutes. 2 x 2 slides.

A Study of Upper Cretaceous Deposits Exposed at Thiele Kaolin Company Pit Eight Miles North of Sandersville, Georgia

THOMAS H. GUTTERY and JOHN A. ALBRITTON, Geology Department
Emory University

Two lenses of kaolin separated by a 10 foot interval of sand have been exposed at the Thiele Kaolin Co. pit located about 8 miles north of Sandersville, Georgia. Several filled stream channels have also been uncovered. These channels are well defined and contain an abundance of preserved plant life. Overlying the top kaolin horizon is a very fossiliferous formation probably of Eocene age.

Statistical size, shape and sorting analyses and heavy mineral separations were made in order to determine the depositional environment and geologic provenance.

The deposits under investigation are probably of Upper Cretaceous age and probably came from an acid environment located fairly close to the northwest.

10 Minutes. 2 x 2 slides.

pH of Rainwater at Emory University, Georgia

WILLARD H. GRANT, Geology Department
Emory University

The pH of rainwater ranges from 4.3 to 6.0. The seasonal variation and variations due to pressure and temperature will be discussed.

10 Minutes.

Stalling's Island Components on the Upper Savannah and Broad Rivers

JOSEPH J. GAINES, Athens, Georgia

Claflin in 1931 reported on the type site of a culture, transitional between the pre-pottery and earliest pottery bearing cultures in northeast Georgia. Charles Fairbanks more recently summarized the findings of a later survey of the Stalling's Island site and compared this Archaic horizon in Georgia with other pre-pottery transitional manifestations in the eastern United States. J. R. Caldwell in 1954 has recorded further results of an archaeological survey in the Savannah River basin and has shown at the Lake Springs site near Clark Hill dam stratigraphic indications of his Old Quartz culture in place beneath a shell midden of Stalling's Island materials.

The author during the years 1950 to 1955 has conducted a personal survey of the territory between the upper Savannah River and its confluence with the Broad River in the Counties of Elbert, Madison, Hart and Lincoln. Also and in addition a site known as Craft's Ferry Landing has been extensively surveyed by the author on the Carolina side of the Savannah River.

Surface collections from these sites show a variety of stone implement traits with the indications that these sites were occupied during the earliest phases of the Stalling's Island period.

Petroleum Geology of the Carolinas

L. E. POWERS

Georgia Institute of Technology

The general geology of the Carolina Coastal Plain is summarized together with the results of such geophysical work as has either been published or is known to the writer. The subsurface geology of the Coastal Plain of North Carolina may be partially delineated as the result of a number of wells that have been drilled during the past decade in the search for oil. The South Carolina plain, however, can only be determined from surface work and geophysics because only a few wells have been drilled in that state. Results to date have been discouraging and the suggestion is made that petroleum possibilities

in this portion of the Atlantic Coastal Plain are rather limited.

The method of classification followed throughout is that suggested by Reeves and Straley.

20 Minutes.

BUSINESS MEETING. ELECTION OF OFFICERS.

EARTH SCIENCE SECTION

FRIDAY, APRIL 29, 1955, 2:30 P.M.

NELSON SEVERINGHAUS and ELDON J. PARIZEK, Presiding

Rural-Farm Population Regions in Georgia

JAMES A. BARNES, Department of Geography and Geology
University of Georgia

Man is not only a part of the geographic landscape, but his activities also condition in large part the past, present and future appearance of most areas. Most of the area of the state of Georgia is rural and much of this area is occupied by farmers and their families. Therefore, because of its wide areal distribution if for nothing else, the rural-farm population is a very important factor in the geography of the state.

When population characteristics of the population are presented for an area of the size and diversity of Georgia, they usually represent little more than average conditions not typical for any considerable portion of the whole. Obviously a much more representative picture is obtained when the state is divided into a number of population regions within each of which the rural-farm population has certain characteristics in common.

This paper, in delimiting such regions for the state of Georgia, concerns itself with three problems: (1) the selection of characteristics of the population which are considered significant, which vary within the state, which are related to other phenomena and which can be expressed areally; (2) the division of these selected characteristics into major classes, preferably those which show areal association; and (3) processing the accumulated data so that it can be expressed in the form of a map.

15 Minutes 3¼ x 4 slides.

Exploration of a Stone Mound in Lumpkin County, Georgia

A. R. KELLY and EDWARD BEAM, Department of Sociology and Anthropology, University of Georgia

In summary, the authors point out the extreme paucity of diagnostic culture material found in definite association with the stone mounds of the Georgia Piedmont region. Previous exploration on this type of site during the last 15 years has not been singularly productive of remains that might help to determine the cultural and chronological position of these structures in Georgia prehistory.

A large stone mound located on Camp Glisson, near Dahlonega, Georgia, was explored in September, 1954, and the results are described and appraised in this paper. For the first time, a number of artifacts, stone work only, were uncovered *in situ* position beneath the mound. These

may imply some form of early ceremonialism in which animals figure. No human remains were uncovered, although the possibility of original human interments is not excluded.

Definite conclusions on such meager evidence are purely tentative, but the hypothesis is entertained that the stone mounds of north and northeast Georgia Piedmont represent an early substratum of aboriginal culture, probably late Archaic, perhaps in some instances transitional to early pottery horizons.

The Rural Non-Farm Population of Georgia

JOHN FRASER HART, Department of Geography
University of Georgia

The rural non-farm population of the United States, as defined in the *1950 Census of Population*, includes "all persons living outside urban areas who do not live on farms." Although the new urban-rural definition used in the 1950 Census makes this a far more homogeneous group than in 1940, the heterogeneous nature of the rural-farm population still creates perplexing problems for the student of population. This paper is a study of the distribution of some selected traits of Georgia's rural non-farm population in 1950. Traits considered include: absolute distribution, absolute density, percentage of non-white, age structure, occupational structure, and industrial structure. The areal distribution of these traits is correlated with the distribution of Georgia's urban population.

20 Minutes. 2 x 2 slides.

History Out of the Ground

JOSEPH R. CALDWELL
Ocmulgee National Monument

Like the data of the other earth sciences, the materials of prehistoric archeology lend themselves to inferences concerning situations which existed in the past. While the subject matter is historical, the approach is scientific. Present studies can determine approximately when prehistoric sites were occupied, can show their cultural position in relation to other prehistoric sites, and can provide information on the development of technology, art, settlement and subsistence patterns, and trade. Even social organization of prehistoric peoples can be inferred, for example, whether simple hunting bands, villages, or settled towns were the most significant social units at particular times.

Occasionally, when the situation has been exceptionally clear, archeologists have recognized the evidence of particular events themselves, as when Wooley uncovered levels at Ur showing that a great flood had occurred, and Sir Arthur Evans brought to light the destruction and sacking of the palace of Minos in Crete.

It appears likely that the time is approaching when the discovery of the actual events of prehistory will not be a matter of accident altogether, but an objective of archeological studies through the formulation of specific criteria which will enable us to recognize them from the evidence in the ground. Our present varieties of historical inference are limited and simplistic, but the fact that we can already recognize some evidence for certain kinds of gradual or rapid cultural change, social disruption, migrations, and ethnic replacement, bodes well for the future of prehistoric archeology.

Explorations at the Stone Effigy Mound, Eatonton, Georgia

VINCENZO PETRULLO

The two stone effigy mounds in Putnam County have been known to archaeologists since 1877 when they were visited and measured by Charles C. Jones. They have been known longer than that to treasure hunters and from time to time attempts have been made to demolish them. Their size has discouraged both treasure hunters and archaeologists, and it is quite certain that before the summer of 1954 when our work was undertaken with funds supplied by the 4-H Foundation neither of the two mounds had been seriously tampered with.

The two mounds rest on the crest of ridges and are built of quartz boulders of various sizes. Of special importance is the fact that not a scrap of archaeological material has been found anywhere on the ridges suggesting that the two mounds which lie about ten miles apart may have been ceremonial centers.

Other ridges nearby are dotted with much smaller, circular mounds. In each case there is a larger mound of definite shape on the crest. Some miles away in the opposite direction there still exist extensive stone 'walls,' or possible linear stone mounds some hundreds of yards long. Many of the stone mounds have been demolished by road builders. Enough mounds remain however to indicate an extensive stone mound complex in the county and to supply the archaeologist with many years of hard work.

Our project extended the archaeological survey previously undertaken by the University of Georgia and finally demolished one of the effigy mounds (and reconstructed it). Although we learned a great deal we were not able to find clear-cut evidence of the use of the mound, and date of construction. Under a thick layer of burnt organic matter we did find a small pre-archaic stone point, and approximately at the hip joint of the bird we found evidence of human cremation. The calcined bones recovered, however, may not throw much light on the date of construction since the quantity recovered may be too small for radio-carbon analysis.

In our opinion, only extensive investigation of many stone mounds, of open camp sites, and village sites which exist in great abundance in Putnam County will eventually throw light on this unique feature—and much neglected one—of American Archaeology.

EARTH SCIENCE SECTION

SATURDAY, APRIL 30, 1955, 9:00 A.M.

NELSON SEVERINGHAUS and ELDON J. PARIZEK, Presiding

Grain Size Analysis of Graywackies

FRANCIS M. BROWN, Geology Department
Emory University

The Great Smoky series contains numerous graywackies which frequently show repeated layers of graded bedding. Thin sections were made through one such layer for the purpose of measuring grain size and determining the percentage of small grains in the coarser portions, and the percentage of large grains in the finer portions. Quartz pebbles were used almost exclusively in the measurements. Expected accuracy from such thin section measurement is approximately seventy-five percent.

10 Minutes. 2 x 2 slides.

The Evolution of the Geologic Map of Georgia

J. G. LESTER, Geology Department
Emory University

In trying to show the evolution of the present Geologic Map of Georgia, it was necessary to examine critically the geologic literature pertinent to Georgia and at the same time to study available early maps of the southeastern part of North America.

The materials, therefore, furnishing data for this study may be broadly divided into four categories: (1) early boundary surveying and interior conjecture, (2) detail mapping of the coastal waters and large rivers, (3) geologic reconnaisance and description of economically important areas and (4) professional and detailed geologic work of a more basic nature dealing with areas not necessarily immediately of economic importance.

30 Minutes. 2 x 2 & 3¼ x 4 slides.

New Evidence of Volcanism in Georgia

VERNON J. HURST

Hornblende gneisses and schists in Paulding, Haralson, and Cherokee Counties contain amygdules and other relic structures indicative of extrusive volcanic origin. The amygdules are preserved as spherical aggregates of fibrous epidote, feldspar, and other minerals. Associated with some of the amygdular zones are breccias which appear to be relic flow breccias.

These relic structures show that a period of volcanism preceded the regional metamorphism of the Piedmont. That this period of volcanism was a major event in the geologic history of the State is shown by the thickness and wide distributions of the amygdaloidal rocks. Other known eruptive rocks in this State are bentonite beds of Ordovician age, in northwest Georgia, and rocks of the Little River series of presumed pre-Cambrian age, in the southern part of the Piedmont.

Progress Report of Geomagnetic Map of The Atlantic Coastal Plain

H. W. STRALEY, III
Georgia Institute of Technology

In 1933, under Rockefeller Foundation auspices, the University of North Carolina began Atlantic Coastal Plains geomagnetic investigations of Carolina Bays and structural features in South Carolina. In 1937, 1940, and 1950, The American Association for the Advancement of Science financed the work. The Geological Society of America financed Prouty on Carolina Bays and The Smith Fund for Research in Pure Science, contributed toward regional studies. The U. S. Bureau of Mines surveyed Florida and Georgia. In 1950, The Society of the Sigma Xi, the University Center in Georgia, The Georgia Academy of Science, and The Georgia Division of Mines, Mining, and Geology contributed. In coordinating work from Florida to Virginia all surveys are collected. To date, the Florida data has been compiled, and that from the Carolinas and Georgia is in process. Within two months all data will be on maps.

This project, when finished, will represent more than twenty years of research. Johnson, MacCarthy, and Straley originally envisaged it to cover the Atlantic Coastal Plain, Blue Ridge, Piedmont, and Appalachian Valleys from Florida to the St. Lawrence.

Thanks are accorded W. F. Prouty, late of the University of North Carolina, and Garland Peyton, late of the Georgia Division of Mines, Mining and Geology. We regret that the project must be abandoned with the present map. It would have added to scientific knowledge and been of commercial value. There is no possibility of securing additional funds. We leave to the future continuation of the work which must fall to other hands.

20 Minutes.

Geochemical Analysis of Various Minerals and Rocks for Nickel Content

A. T. NAVARRE
Georgia Institute of Technology

Many igneous rocks, as well as minerals formed by various processes, contain either nickel as trace, or sometimes in significant amounts. This is particularly true of the serpentine group. However, numerous analyses made of pyrogenetic minerals with a sheeted structure, such as biotite, phlogopite, show nickel ions in various amounts. Many carbonate minerals, such as magnesite, dolomite, ankerite, rhodochrosite, breunerite, show nickel content. The same applies to magnesian limestone in Georgia and the Knox dolomite from the Mascot zinc mines in Tennessee. Surprisingly, lazulite from Graves Mountain, Georgia, shows a nickel content. All reactions were carried out in an ammoniated solution with dimethylgloxime reagent, which is one of the most sensitive indicators for metallic ion.

20 Minutes.

Magnetic Map of Southwestern Georgia Piedmont

J. T. BRADFORD, E. L. BRADLEY, and J. M. GOSS
Georgia Institute of Technology

During the course of the 1954 field season, the writers conducted field work in the area immediately West, South and Southeast of Atlanta, Georgia. Using a Schmidt type (Askania Werke) vertical-field balance and occupying stations at about two mile intervals along the principal highways of the area, they conducted a magnetic survey of a number of counties within the Georgia Piedmont. The work constitutes a part of the Atlantic Seaboard Project as conceived currently. The results of this survey are depicted on isomagnamic maps and magnetic profiles of, and across, the area.

10 Minutes. 3¼ x 4 slides.

The Geomagnic Map of the Georgia Gold Belt

WILLIAM SCOTT and H. W. STRALEY, III
Georgia Institute of Technology

Using the same type of instruments as described by Messrs. Bradford, Bradley, and Goss, the writers conducted a magnetic survey over the portion of the Gold Belt of Georgia, which lies within the Piedmont area of that state. With certain limited exceptions stations were taken at about two mile intervals along most of the major highways of that area. In

areas where presence of magnetite was suspected stations were placed at closer intervals sometimes within the interroad area. The results of this survey are depicted in accompanying iceoplethic maps and magnetic profiles drawn across the structures uncovered by the survey.

15 Minutes. 3¼ x 4 slides.

Section IV

PHYSICS, MATHEMATICS and ENGINEERING SECTION

FRIDAY, APRIL 29, 1955, 9:00 A.M.

Room 203, Baldwin Hall

Chairman, E. H. DIXON, Presiding

Radiations from the Night Sky

C. D. COOPER, Department of Physics
(On Leave at Harvard University)
University of Georgia

Invited Speaker. 30 Minutes.

Early Reaction to X-Rays

R. GILBERT HENRY, Department of Physics
University of Georgia

An authentic report of how the engineering class at the University of Georgia received the news of the discovery of X-Rays.

This is mainly a newspaper account, as kept in a scrapbook by the class, telling how the news was received and how it developed locally and nationally, with some rivalry among our nearby institutions.

20 Minutes.

Analyses of Some Observed Values of Osmotic Pressures of Chain Polymer Solutions

T. A. BARR and H. B. JENKINS, Department of Physics
University of Georgia

The observed values of osmotic pressures of polyethylene glycols in water and polystyrenes in methyl ethyl ketone have shown marked deviations from theoretical values when measured in a metal membrane osmometer. These deviations can be explained if one assumes that the solute (polymer) molecules diffuse out of the osmometer at the same time that the solvent molecules are entering the osmometer. The net effect is that the observed osmotic pressures increase with increasing molecular weight of solute whereas the theoretical values decrease.

15 Minutes. 3¼ x 4 slides.

Comments on Methods of Presenting the Del Operator

J. H. BURKHALTER
University of Georgia

The advantages of redefining the del operator in terms of purely geometric concepts over the standard definition for rectangular coordinate systems is discussed. Contrasts are discussed between the two methods in regard to ease in building concepts, total mathematical manipulation required, mathematical elegance, and ease of changing coordinate systems.

20 Minutes.

A Photoelectric Luminance Meter with Small Acceptance Angle

W. A. CALDER
Agnes Scott College

The development of miniature photocells of high sensitivity opens the way for compact photometers of great versatility. An exposure meter with a cone of acceptance of less than a half a degree was made by mounting a CdS cell in the focal plane of the objective of an optical gunsight. A beam-splitter enables the user to see the minute area of the subject which is being measured. An auxiliary lens before the objective converts the instrument into a reflection densitometer which will measure the reflectivity of one square mm of a print. This device might be useful to the serious photographer or teacher.

5 Minutes.

Effect of Temperature on Ultrasonic Velocity in Acrolein

ANDREW ROBESON and D. R. McMILLAN, Physics Department
Emory University

Ordinarily the velocity of ultrasonic waves in a pure liquid decreases uniformly with an increase in temperature. For some liquids, notably water, the ultrasonic velocity is not, however, a linear function of temperature. In such liquids it has been observed that molecular association is present and the departure from linearity has been attributed to this effect. It has also been observed that, in general, the ultrasonic velocity in a cis isomer is greater than for the trans isomer. This would lead one to conclude that if the cis and trans isomers are in equilibrium, and the percentage composition is temperature dependent, a measurement of ultrasonic velocity over a sufficiently wide temperature range should reveal any change in the relative amounts of the isomers.

Velocity measurements were made at 500 Kc/sec with the ultrasonic interferometer described previously by McMillan and Lagemann. Temperature measurements were made with a Bureau of Standards calibrated thermometer and the reported values are correct to about .05 °C. Preliminary measurements tend to show that the ultrasonic velocity in acrolein varies linearly with temperature as is the case for pure unassociated organic compounds. The compound will be purified by distillation and additional measurements taken.

10 Minutes. 3¼ x 4 slides.

New Construction of Telescope

KONSTANTIN D. KOLITSCHEW
Piedmont College

The principal of construction of telescopes is based on the use of a lens (objective) to receive a real image of an object and a second lens (eye-piece) to look at the image as through a magnifying glass. When a third lens is used (like in a terrestrial telescope) its function is only to invert the image without changing its size (erector).

By using three lenses a new construction of a telescope may be realized. This construction may be called a telescope with two objective or a telescope with added enlargement because the difference in construction from the old one is in using the second objective as an enlarger of the image produced by the first lens (objective).

The difference between this and the usual construction is in the size of the image for the eye-piece, this image may be enlarged by the second objective as many times as it is desired or possible.

The partial magnifications in such a telescope are: the angular magnification between first objective and second; the magnification produced by the second objective; the magnification produced by the eye-piece. As ever the total magnification is the product of the partial magnification of the construction. In this case the total magnification is directly proportional to the focal length of its first objective and the second power of the enlargement desired from the second objective and inversely proportional to the focal length of the second objective, the focal length of the eye-piece and first power of enlargement required from the second objective.

The new telescope may be used as an astronomical one, as terrestrial one and as distancemeter.

20 Minutes.

BUSINESS MEETING. ELECTION OF OFFICERS.

PHYSICS, MATHEMATICS and ENGINEERING SECTION

2:30 P.M.

Solvable and Unsolvable Problems

TREVOR EVANS
Emory University

Invited Speaker. 30 Minutes.

Trigonometry for Calculus Students

R. D. BOSWELL, JR., Department of Mathematics
University of Georgia

The sine and cosine functions are defined by the usual power series expansion. Using elementary theorems of calculus, the basic properties of these functions are proved.

A Versatile Coincidence Pulse Analyzer

R. H. ROHRER and J. B. BAILEY, Department of Physics
Emory University

An instrument has been constructed which utilizes a cathode-ray tube presentation of pulses from two scintillation counters for coincidence analysis. It may be used as a single-channel differential pulse analyzer or for the discrimination of coincident pulses. The energy and time resolutions compare favorably with those obtained using all-electronic circuits. The circuit and the performance of the instrument will be discussed.

15 Minutes. 3¼ x 4 slides.

The Coincidence Pulse Spectra of Positron and Gamma Radiations

A. K. FURR, Department of Physics
Emory University

An analysis is made of the energy distribution of the quanta causing coincident scintillation pulses from a gamma-ray and positron emitter (Zn^{65}). Double- and triple-coincidence measurements were made using NaI and plastic scintillators. The Cathode-ray tube discriminator described in a previous paper and other coincidence discriminators were employed. The problems which were encountered in the analysis will be discussed.

15 Minutes. 3¼ x 4 slides.

Measurement of the Gamma - Positron Branching Ratio in Zn^{65},

J. B. BAILEY, Department of Physics
Emory University

By comparing the single-channel differential pulse height spectrum of radiation from zinc 65 with the coincident annihilation gamma spectrum, the positron - to - gamma branching ratio in the decay of that isotope has been calculated. The problems encountered in these calculations and the sensitivity of the method to positron emission will be discussed.

15 Minutes. 3¼ x 4 slides.

SECTION V

PSYCHOLOGY and MEDICINE SECTION

FRIDAY, APRIL 29, 1955, 9:00 A.M.

Room 112, Baldwin Hall

Chairman, KATHARINE T. OMWAKE

A Study of Factors Related to Self-Deception

JOHN A. HORNADAY, Department of Psychology
Shorter College

One of the factors that has prevented a wider application of objective-type personality questionnaires is their vulnerability to faking. Numerous studies have shown that virtually every well-known paper-and-pencil test, as well as the projective techniques, is subject to error when the examinee is for any reason motivated to distort his responses. Recently, the authors of certain tests have developed "falsification scales" which, aside from their intrinsic value in measuring a psychological characteristic, give an indication of the validity of the other test scales for that particular examinee.

Very little research has been done, however, into the causes of faking; particularly into the question of measuring the extent to which a person deceives himself about his personal characteristics. Such measurement would have both theoretical and practical value, especially so if the factors in the personality that occur in conjunction with self-deception could be indicated.

Using clinical evaluation as a criterion, objective items purporting to measure seven personality factors were given to self-deceivers; and statistical studies were made to determine which factors best distinguished between the groups. It appeared that items pertaining to anxiety, the schizoid tendency, lack of leadership and sado-masochism related most closely to self-deception whereas three other factors were either of no value or of doubtful relation. The results would indicate that self-deception can be measured and give a suggestion as to the kinds of items that might be most fruitfully used.

20 Minutes.

A Note on the Methodology of Research Design in Opinion Research

JAMES E. GREENE, College of Education
University of Georgia

The present study is an outgrowth of a detailed and comprehensive previous study of the presumably "informal opinions" of seven separate groups of respondents concerning the current strengths and weaknesses of educational programs in hospital schools of nursing in the continental United States. In the previous contract research project, made possible by a special subvention of funds to the National Organization of Hospital Schools of Nursing from an anonymous foundation, the writer was confronted with the onerous task of devising and implementing an over-all research design which fould furnish valid and comparable data about the "informal opinions" of the following seven groups of respondents: hospital administrators, directors of nursing, directors of nursing education, hospital medical personnel, faculty members, recent graduates

of the hospital school of nursing, and third-year student nurses. The present paper discusses and illustrates the comparative merits and demerits of two major devices employed in the analysis of opinions held by the seven previously listed groups of respondents. These devices were:

(a) "Open-end" questions (i.e., completely "unstructured" items which gave the respondent complete freedom of expression of opinion).

(b) "Pre-categorized" items (i.e., items to which the respondent must reply by choosing from among several pre-determined response categories presented. In effect, this amounted to a modified "forced choice" situation).

The general implications of the findings for the structuring of research designs in opinion research will be discussed briefly.

15 Minutes.

A Comparison of Thematic Apperception Test Results from a Group of Juvenile Delinquents and a Control Group

FLORENE M. YOUNG, Department of Psychology
University of Georgia

The Thematic Apperception Test was administered to 34 delinquent boys and 34 delinquent girls, all of whom were institutionalized. The average age of the boys was 14 years, 9 months, and for the girls the mean age was 15 years, 10 months.

Delinquent boys most frequently referred to the father figure (38%) as advising the child. More than one-third of the boys described the injury, illness or death of the father and 20.6% specified that the son killed the father. On the basis of desirable attributes, the delinquent boy appears to admire the father more than the mother.

Delinquent girls tend to depict undesirable rather than desirable traits in both parents, and this is significantly true in case of the mother. To both boys and girls, the mother is the more punitive parent, the parent who requires work, study or practice, and the one from whom the child runs away.

Comparisons of 68 delinquents and 49 non-delinquents revealed marked differences in attitude to home, type of theme, and tone of plot.

15 Minutes.

Some Fundamental Facts Concerned with Medical Sex Counseling

G. LOMBARD KELLY, M.D., President Emeritus
Medical College of Georgia

Discussion of personnel engaged in sex and marital counseling and a summary of agencies cooperating with such personnel. Causes for need of sex and marriage counseling such as general incompatability, insufficient funds, alcoholism, etc. Sexual incompatability based on deficiencies in the male, such as premature ejaculation and impotence. Diagnosis and treatment. Definition of principal cause of incompatability based on deficiency in the female, namely, frigidity. Diagnosis and treatment. Discussion of masturbation. Reference to sexual perversion.

20 Minutes.

Dwarfs

J. HIRAM KITE, M.D.
Scottish Rite Hospital

Some dwarfs are too small when they are born and are known as primordial dwarfs. Others are normal at birth, but suffer a delay or cessation of growth later. In the broad sense dwarfism includes all conditions characterized by stunted growth. The term "infantilism" strictly applies to individuals in whom there is an impairment of growth, sex and intellect, while the term "nanism" is used to imply conditions in which there is impairment of growth only.

There are more than a dozen different kinds of dwarfs. Some are due to an abnormality of the endocrine system, as cretinism. Some are due to a congenital disorder of the germ plasm as the mongolian. Dwarfs may be divided into two classes. Proportionate dwarfs as the Pygmy in Africa, who are born small and never reach five feet in height, and the disproportionate dwarf as the chondrodystrophic dwarf. In achondroplasia the trunk is of the normal length but the arms and legs are short.

Dwarfs are seldom encountered in routine medical practice. They are often difficult to classify. There is little that can be done to stimulate growth. The accompanying deformities can be corrected by the usual orthopedic procedures. Slides will be shown illustrating the changes in the appearance and in the bones in cretins, mongolians, Morquio's disease, Hurler's disease, vitamin D resistant rickets, and achondroplasia.

20 Minutes. Slides.

Growth Hormone Action in Pyridoxine Deficiency

EVANGELINE PAPAGEORGE and JEAN PORTER MURPHY
Department of Biochemistry
Emory University

Administration of anterior pituitary growth hormone (GH) to normal animals, maintained on adequate diets, promotes gain in body weight and nitrogen retention. In studying these effects, multiple injections of GH are usually made over a period of days, and nitrogen retention is determined by balancing nitrogen intake against nitrogen output. It has been reported that in rats maintained on diets deficient in any of a number of nutrients, including pyridoxine, GH fails to promote normal response and often aggravates the symptoms of deficiency.

This study involved two short-term effects of GH which are produced by a single dose of hormone: (1) elevation of cardiac glycogen, (2) decreased urea production, as measured by blood urea levels in the nephrectomized rat after intravenous injection of a protein hydrolysate. Neither of these methods of manifestation of GH action have been previously employed in nutritional deficiency studies. It was first determined that B_6-deficient animals behaved like normally-fed controls in that polysaccharide concentration in the heart rose considerably after 18 hours of fasting. GH was found to promote the storage of heart glycogen in pyridoxine deficiency, provided that food intake was not markedly diminished. In the study of nephrectomized rats, GH depressed urea production in the pyridoxine-deficient group subjected to the same routine as the controls. Implications of these observations will be discussed.

15 Minutes. 3¼ x 4 slides.

Recent Studies on the Relationship of the Electrical Activity of the Brain to Behavior

HUDSON JOST, Department of Psychology
University of Georgia

20 Minutes.

The Ageless Ones

EMILY BARRY WALKER, Department of Science
Darlington School

This study is a byproduct of an investigation made last year of the incidence of Cerebral Palsy in the Far East. The countries in which the observations were made include Japan, Formosa, China (Hong Kong), Philippines, Borneo, Singapore, and India.

The little women of the Far East were characteristically energetic, cheerful and consistent. The geriatrics of a people like that is a fascinating study. They looked old—these brave little women—but led a life of such energy it was impossible to attach such a word to them as a group.

This paper does not pretend to be a complete study, but rather a suggestive resume of observations and conversations with the little women of the Far East.

15 Minutes. 35mm. slides.

SECTION BUSINESS MEETING. ELECTION OF OFFICERS.

PSYCHOLOGY and MEDICINE SECTION

2:30 P.M.

Auditorium, Baldwin Hall

Chairman, KATHARINE T. OMWAKE

Symposium on Problems of Aging

(The public is invited)

DR. HERMAN W. MARTIN, Moderator, Professor of Psychology
Emory University

Dr. Anna Greene Smith, Associate Professor of Sociology, Agnes Scott College	South's Share of the Nation's Aged
Dr. Albert Lansing, Chairman, Department of Anatomy, Emory University	Biological Aspects of Aging
Dr. J. Elliott Scarborough, M.D., Director, Winship Clinic, Emory University	Medical Aspects of Aging
Dr. Austin S. Edwards, Former Chairman, Department of Psychology, University of Georgia	Psychological Problems in Aging
Mr. Wellborn R. Ellis, Administrator, Fulton County Department of Public Welfare	Practical Experiments on Aging Problems

SECTION VII

SCIENCE EDUCATION SECTION

SATURDAY, APRIL 30, 1955, 9:00 A.M.

Room 112, Baldwin Hall

Chairman, MRS. HELENE NORWOOD LAMMERS

Revitalizing the High School Chemistry Course

MISS BELLE B. COOPER
North Fulton High School, Atlanta

A study in securing the proper balance between mastery of scientific principles, applying them to modern home and industry, and solving problems by the scientific method.

10 Minutes.

A Handbook for Laboratory Assistants in Biology

KATHERINE HERTZKA, Biology Department
Hoke Smith High School, Atlanta

A guide to help High School laboratory assistants to carry out their duties with sections on general directions, techniques, making solutions, cultures and some specific laboratory methods.

5 Minutes.

"Visualizing Probability in Genetics"

PAUL GUPTILL, Biology Department
North Fulton High School, Atlanta

Using the modern art form, the mobile, it is possible to demonstrate all sorts of combinations of monohybrid and dihybrid characteristics.

5 Minutes.

"The Frog, A Film Strip with Recorded Direction for Dissection"

LOUISE STAKELEY, Human Biology
Henry Grady High School, Atlanta

9 Minutes.

On Demonstration—Useful Teaching Aids and Charts for use in Human Biology

HELENE NORWOOD LAMMERS, Human Biology
Murphy High School, Atlanta

A demonstration of the separation of the bronchial, arterial and venous trees in the lungs of the foetal pig.

A Presentation of some Lecture Demonstrations which have Proven Helpful in the High School Physics Class

RICHARD N. JONES, Department of Physics
North Fulton High School

Principles of mechanics, heat, light, sound, electricity and others will be presented and illustrated.

The Opportunities Offered the Science Teacher at the Oak Ridge Institute of Nuclear Studies

VIRGINIA PARKER
Jordan High School, Columbus

The first "Special Course in the use of Radioisotopes in Secondary School Teaching" was offered by the Special Training Division of the Oak Ridge Institute of Nuclear Studies, June 7-18, 1954. This course was designed to present the techniques of using radioisotopes in classroom demonstrations and in laboratory work. It included background lectures in physics and radioactivity, laboratory work lectures by guest speakers, and field trips to nearby experiment stations, museums, commercial laboratories and normally restricted areas at Oak Ridge.

An extraordinary full schedule made it possible to offer such a large number of experiences in the two weeks time. The course was most beneficial to all who were privileged to attend.

10 Minutes.

"Methods in Training Science Teachers for the Demands of Today"

JESSIE TRAWICK, Department of Chemistry
Georgia State College for Women

The science teacher of today has many more demands and many new facilities at hand with which to vitalize the teaching of science. Many new and improved methods of presentation have been developed which have proven helpful.

10 Minutes.

"European vs. American Opportunities for the Development of Scientific Students"

WILLIAM A. MaGUIRE, Department of Physics
Marist College

A comparison of curricula in science courses between continental Europe and United States colleges made on a recent tour of Europe will be presented. Courses in Civil, Mechanical and Chemical Engineering and Architecture and the regular science courses will be contrasted.

A report on a visit to the British Museum of Science in London will be made.

20 Minutes.

A Report on the Southeastern Work Conference on Biology Teaching

ANNIE SUE BROWN, Science Coordinator
Atlanta Public Schools

The Southeastern Work Conference on Biology teaching was sponsored by the National Association of Biology Teachers in cooperation with the American Institute of Biological Sciences and held at Gainesville, Fla., August 28 through September 6, 1954. It was made possible by a $15,000 grant from the National Science Foundation.

Attending and taking active part in the conference were nearly 100 men and women interested in various phases of biology teaching.

Using group discussion methods, biology teaching in high schools and colleges was considered from many points of view, including those of the research biologist, the college teacher, the methods teacher, the secondary school teacher and administrative officers at all levels. Basic problems of all groups were presented and considered by the entire conference. This conference was the first to bring together a large number of people from all levels of teaching for simultaneous consideration of problems in the teaching of biology. The total biology training program from introductory high school biology courses through advanced professional training of biology teachers and researchers was brought into sharp focus.

A Study of the Properties and Uses of Radiant Energy

D. R. McMILLAN, Physics Department
Emory University

In connection with their study of radiant energy a group of science students from the Atlanta School System visited the physics department of Emory University recently. The author undertook the task of presenting to these students the physical properties of radiant energy and discussing some of the practical applications of radiation. Experiments designed to illustrate the wave nature of radiation were demonstrated for the group.

Since these experiments may be performed in the high school laboratory or lecture room, it was thought that the Science Education Section would be interested in them and their method of presentation.

20 Minutes.

Materials needed: Large table equipped with a.c. electricity and gas outlets.

The Role of the Laboratory in Science Education

W. H. EBERHARDT, Department of Chemistry
Georgia Institute of Technology

For reasons of efficiency in the handling of large numbers of students, emphasis in science teaching has shifted from the laboratory to the classroom. This shift has resulted in serious changes of perspective in both the instructor and the student and a re-examination of the role of laboratory work seems to be needed urgently. It is hoped that this presentation will serve as a stimulus for discussion of the problem.

20 Minutes.

BUSINESS MEETING AND ELECTION OF OFFICERS.